

SEQUENCE LISTING

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<210> 3

<211> 2614

<212> DNA

<213> Mouse

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<223>

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cgggggctgg gacagcaggg cggcgggcgg agcgtgggag ggggctctag gactctgccg 180  
gccccgcccc gccccctccg cggggacccg gagcccagca tggaccacac tcggcgccgc 240  
agcc atg gcg etc gcc cgc tgc gtg ctg gct gtg att tta ggg gca ctg 289

001100-2164100

M t Ala Leu Ala Arg Cys Val Leu Ala Val Ile Leu Gly Ala Leu.

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Ser Val Val Ala Arg Ala Asp Pro Val Ser Arg Ser Pro Leu His Arg				
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ccg cat cgc too cca ccg cgt tcc caa cac gcg cac tac ctt ccc agc				385
Pro His Pro Ser Pro Pro Arg Ser Gln His Ala His Tyr Leu Pro Ser				
35	40	45		
tgc cgg cgg cca ccc agg acc ccg cgc ttc ccg ctc ccg ctg cgg atc				433
Ser Arg Arg Pro Pro Arg Thr Pro Arg Phe Pro Leu Pro Leu Arg Ile				
50	55	60		
ccc gct gcc cag cgc ccg cag gtc cto agc acc ggg cac acg ccc ccg				481
Pro Ala Ala Gln Arg Pro Gln Val Leu Ser Thr Gly His Thr Pro Pro				
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Thr Ile Pro Arg Arg Cys Gly Ala Gly Glu Ser Trp Gly Asn Ala Thr				
80	85	90	95	
aac ctc ggc gtc ccg tgt cta cac tgg gac gag gtg ccg ccc ttc ctg				577
Asn Leu Gly Val Pro Cys Leu His Trp Asp Glu Val Pro Pro Phe Leu				
100	105	110		
gag cgg tgc ccc ccg gcc agt tgg gct gag ctg cga ggg cag ccg cac				625
Glu Arg Ser Pro Pro Ala Ser Trp Ala Glu Leu Arg Gly Gln Pro His				
115	120	125		
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Asn Phe Cys Arg Ser Pro Asp Gly Ser Gly Arg Pro Trp Cys Phe Tyr				
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Arg Asn Ala Gln Gly Lys Val Asp Trp Gly Tyr Cys Asp Cys Gly Gln				
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Gly Pro Ala Leu Pro Val Ile Arg Leu Val Gly Gly Asn Ser Gly His				
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Glu Gly Arg Val Glu Leu Tyr His Ala Gly Gln Trp Gly Thr Ile Cys				
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Gly Leu Ser Gly Ile Ala Lys Ala Trp His Gln Ala His Phe Gly Glu	
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gga tct ggc cca ata ttg ttg gat gaa gta cgc tgc acc gga aac gag	961
Gly Ser Gly Pro Ile Leu Leu Asp Glu Val Arg Cys Thr Gly Asn Glu	
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Leu Ser Ile Glu Gln Cys Pro Lys Ser Ser Trp Gly Glu His Asn Cys	
240 245 250 255	
ggc cat aaa gaa gat gct gga gtg tct tgt gtt cct cta aca gat ggt	1057
Gly His Lys Glu Asp Ala Gly Val Ser Cys Val Pro Leu Thr Asp Gly	
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gtc atc aga ctg gca gga gga aaa agt acc cat gaa ggt cgc ctg gag	1105
Val Ile Arg Leu Ala Gly Gly Lys Ser Thr His Glu Gly Arg Leu Glu	
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Val Tyr Tyr Lys Gly Gln Trp Gly Thr Val Cys Asp Asp Gly Trp Thr	
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Glu Met Asn Thr Tyr Val Ala Cys Arg Leu Leu Gly Phe Lys Tyr Gly	
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Lys Gln Ser Ser Val Asn His Phe Asp Gly Ser Asn Arg Pro Ile Trp	
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Leu Asp Asp Val Ser Cys Ser Gly Lys Glu Val Ser Phe Ile Gln Cys	
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Ser Arg Arg Gln Trp Gly Arg His Asp Cys Ser His Arg Glu Asp Val	
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Gly Leu Thr Cys Tyr Pro Asp Ser Asp Gly His Arg Leu Ser Pro Gly	
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Phe Pro Ile Arg Leu Val Asp Gly Glu Asn Lys Lys Glu Gly Arg Val	
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Glu Val Phe Val Asn Gly Gln Trp Gly Thr Ile Cys Asp Asp Gly Trp	
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Thr Asp Lys His Ala Ala Val Ile Cys Arg Gln Leu Gly Tyr Lys Gly	
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cct gcc aga gca agg act atg gct tat ttt ggg gaa gga aaa ggc ccc	1585
Pro Ala Arg Ala Arg Thr Met Ala Tyr Phe Gly Glu Gly Lys Gly Pro	
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Ile His Met Asp Asn Val Lys Cys Thr Gly Asn Glu Lys Ala Leu Ala	
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Asp Cys Val Lys Gln Asp Ile Gly Arg His Asn Cys Arg His Ser Glu	
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Asp Ala Gly Val Ile Cys Asp Tyr Leu Glu Lys Lys Ala Ser Ser Ser	
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Gly Asn Lys Glu Met Leu Ser Ser Gly Cys Gly Leu Arg Leu Leu His	
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Trp Pro Trp Gln Ala Ser Leu Arg Leu Arg Ser Ala His Gly Asp Gly	
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Arg Leu Leu Cys Gly Ala Thr Leu Leu Ser Ser Cys Trp Val Leu Thr	
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Ala Ala His Cys Phe Lys Arg Tyr Gly Asn Asn Ser Arg Ser Tyr Ala	
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Arg Ser Asp Tyr Asp Ile Ala Leu Val Arg Leu Gln Gly Pro Gly Glu  
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caa tgt gcc aga cta agc acc cac gtt ttg cca gcc tgt tta cct cta 2161  
Gln Cys Ala Arg Leu Ser Thr His Val Leu Pro Ala Cys Leu Pro Leu  
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tgg aga gag agg cca cag aaa aca gcc tcc aac tgt cac ata aca gga 2209  
Trp Arg Glu Arg Pro Gln Lys Thr Ala Ser Asn Cys His Ile Thr Gly  
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tgg gga gac aca ggt cgt gcc tac tca aga act cta caa caa gct gct 2257  
Trp Gly Asp Thr Gly Arg Ala Tyr Ser Arg Thr Leu Gln Gln Ala Ala  
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Val Pro Leu Leu Pro Lys Arg Phe Cys Lys Glu Arg Tyr Lys Gly Leu  
675 680 685

ttt act ggg aga atg ctc tgt gct ggg aac ctc caa gaa gac aac cgt 2353  
Phe Thr Gly Arg Met Leu Cys Ala Gly Asn Leu Gln Glu Asp Asn Arg  
690 695 700

gtg gac agc tgc cag gga gac agt gga gga cca ctc atg tgt gaa aag 2401  
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705 710 715

cct gat gag tcc tgg gtt gtg tat ggg gtg act tcc tgg ggg tat gga 2449  
Pro Asp Glu Ser Trp Val Val Tyr Gly Val Thr Ser Trp Gly Tyr Gly  
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Cys Gly Val Lys Asp Thr Pro Gly Val Tyr Thr Arg Val Pro Ala Phe  
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35 40 45  
Arg Arg Pro Pro Arg Thr Pro Arg Phe Pro Leu Pro Leu Arg Ile Pro  
50 55 60  
Ala Ala Gln Arg Pro Gln Val Leu Ser Thr Gly His Thr Pro Pro Thr  
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Ile Pro Arg Arg Cys Gly Ala Gly Glu Ser Trp Gly Asn Ala Thr Asn  
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Arg Ser Pro Pro Ala Ser Trp Ala Glu Leu Arg Gly Gln Pro His Asn  
115 120 125  
Phe Cys Arg Ser Pro Asp Gly Ser Gly Arg Pro Trp Cys Phe Tyr Arg  
130 135 140  
Asn Ala Gln Gly Lys Val Asp Trp Gly Tyr Cys Asp Cys Gly Gln Gly  
145 150 155 160  
Pro Ala Leu Pro Val Ile Arg Leu Val Gly Gly Asn Ser Gly His Glu  
165 170 175  
Gly Arg Val Glu Leu Tyr His Ala Gly Gln Trp Gly Thr Ile Cys Asp  
180 185 190  
Asp Gln Trp Asp Asn Ala Asp Ala Asp Val Ile Cys Arg Gln Leu Gly  
195 200 205  
Leu Ser Gly Ile Ala Lys Ala Trp His Gln Ala His Phe Gly Glu Gly  
210 215 220  
Ser Gly Pro Ile Leu Leu Asp Glu Val Arg Cys Thr Gly Asn Glu Leu  
225 230 235 240  
Ser Ile Glu Gln Cys Pro Lys Ser Ser Trp Gly Glu His Asn Cys Gly  
245 250 255

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Tyr	Tyr	Lys	Gly	Gln	Trp	Gly	Thr	Val	Cys	Asp	Asp	Gly	Trp	Thr
290				295				300						
Met	Asn	Thr	Tyr	Val	Ala	Cys	Arg	Leu	Leu	Gly	Phe	Lys	Tyr	Gly
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Gln	Ser	Ser	Val	Asn	His	Phe	Asp	Gly	Ser	Asn	Arg	Pro	Ile	Trp
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Pro	Ile	Arg	Leu	Val	Asp	Gly	Glu	Asn	Lys	Lys	Glu	Gly	Arg	Val
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610 615 620  
Cys Ala Arg Leu Ser Thr His Val Leu Pro Ala Cys Leu Pro Leu Trp  
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645 650 655  
Gly Asp Thr Gly Arg Ala Tyr Ser Arg Thr Leu Gln Gln Ala Ala Val  
660 665 670  
Pro Leu Leu Pro Lys Arg Phe Cys Lys Glu Arg Tyr Lys Gly Leu Phe  
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705 710 715 720  
Asp Glu Ser Trp Val Val Tyr Gly Val Thr Ser Trp Gly Tyr Gly Cys  
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15



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Pro Arg Pro His Pro Trp Gly Cys Pro Ala Gly Glu Pro Trp Val Ser	
35 40 45	
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Val Thr Asp Phe Gly Ala Pro Cys Leu Arg Trp Ala Glu Val Pro Pro	
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Phe Leu Glu Arg Ser Pro Pro Ala Ser Trp Ala Gln Leu Arg Gly Gln	
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Arg His Asn Phe Cys Arg Ser Pro Asp Gly Ala Gly Arg Pro Trp Cys	
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Phe Tyr Gly Asp Ala Arg Gly Lys Val Asp Trp Gly Tyr Cys Asp Cys	
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Arg His Gly Ser Val Arg Leu Arg Gly Gly Lys Asn Glu Phe Glu Gly	
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Thr Val Glu Val Tyr Ala Ser Gly Val Trp Gly Thr Val Cys Ser Ser	
130 135 140	
cac tgg gat gat tct gat gca tca gtc att tgt cac cag ctg cag ctg	480
His Trp Asp Asp Ser Asp Ala Ser Val Ile Cys His Gln Leu Gln Leu	
145 150 155 160	
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Ile Pro Ile Tyr Trp Ser Asn Val Arg Cys Arg Gly Asp Glu Glu Asn	
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Gln Cys Pro Lys Ser Ser Trp Gly Glu His Asn Cys Gly His Lys Glu	
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Trp Gly Arg His Asp Cys Ser His Arg Glu Asp Val Ser Ile Ala Cys	
420 425 430	
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Tyr Pro Gly Gly Glu Gly His Arg Leu Ser Leu Gly Phe Pro Val Arg	
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Leu Met Asp Gly Glu Asn Lys Lys Glu Gly Arg Val Glu Val Phe Ile	
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Asn Val Lys Cys Thr Gly Asn Glu Arg Ser Leu Ala Asp Cys Ile Lys	
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Gln Asp Ile Gly Arg His Asn Cys Arg His Ser Glu Asp Ala Gly Val	
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Ile Cys Asp Tyr Phe Gly Lys Lys Ala Ser Gly Asn Ser Asn Lys Glu	
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Arg Ile Ile Gly Gly Lys Asn Ser Leu Arg Gly Gly Trp Pro Trp Gln	
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Gly Ala Thr Leu Leu Ser Ser Cys Trp Val Leu Thr Ala Ala His Cys	
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Phe Lys Arg Tyr Gly Asn Ser Thr Arg Ser Tyr Ala Val Arg Val Gly	
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Asp Tyr His Thr Leu Val Pro Glu Glu Phe Glu Glu Glu Ile Gly Val	
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Gln Gln Ile Val Ile His Arg Glu Tyr Arg Pro Asp Arg Ser Asp Tyr	
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675 680 685	
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Phe Ser Ser His Val Leu Pro Ala Cys Leu Pro Leu Trp Arg Glu Arg	
690 695 700	
cca cag aaa aca gca tcc aac tgt tac ata aca gga tgg ggt gac aca	2160
Pro Gln Lys Thr Ala Ser Asn Cys Tyr Ile Thr Gly Trp Gly Asp Thr	
705 710 715 720	
gga cga gcc tat tca aga aca cta caa caa gca gcc att ccc tta ctt	2208
Gly Arg Ala Tyr Ser Arg Thr Leu Gln Gln Ala Ala Ile Pro Leu Leu	
725 730 735	
cct aaa agg ttt tgt gaa gaa cgt tat aag ggt cgg ttt aca ggg aga	2256
Pro Lys Arg Phe Cys Glu Glu Arg Tyr Lys Gly Arg Phe Thr Gly Arg	
740 745 750	
atg ctt tgt gct gga aac ctc cat gaa cac aaa cgc gtg gac agc tgc	2304
Met Leu Cys Ala Gly Asn Leu His Glu His Lys Arg Val Asp Ser Cys	
755 760 765	
cag gga gac agc gga gga cca ctc atg tgt gaa cgg ccc gga gag agc	2352
Gln Gly Asp Ser Gly Gly Pro Leu Met Cys Glu Arg Pro Gly Glu Ser	
770 775 780	

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 Trp Val Val Tyr Gly Val Thr Ser Trp Gly Tyr Gly Cys Gly Val Lys  
 785 790 795 800  
 gat tct cct ggt gtt tat acc aaa gtc tca gcc ttt gta cct tgg ata 2448  
 Asp Ser Pro Gly Val Tyr Thr Lys Val Ser Ala Phe Val Pro Trp Ile  
 805 810 815  
 aaa agt gtc acc aaa ctg taattcttca tggaaacttc aaagcagcat 2496  
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 Pro Arg Pro His Pro Trp Gly Cys Pro Ala Gly Glu Pro Trp Val Ser  
 35 40 45  
 Val Thr Asp Phe Gly Ala Pro Cys Leu Arg Trp Ala Glu Val Pro Pro  
 50 55 60  
 Phe Leu Glu Arg Ser Pro Pro Ala Ser Trp Ala Gln Leu Arg Gly Gln  
 65 70 75 80  
 Arg His Asn Phe Cys Arg Ser Pro Asp Gly Ala Gly Arg Pro Trp Cys  
 85 90 95  
 Phe Tyr Gly Asp Ala Arg Gly Lys Val Asp Trp Gly Tyr Cys Asp Cys  
 100 105 110  
 Arg His Gly Ser Val Arg Leu Arg Gly Gly Lys Asn Glu Phe Glu Gly  
 115 120 125  
 Thr Val Glu Val Tyr Ala Ser Gly Val Trp Gly Thr Val Cys Ser Ser  
 130 135 140

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His	Trp	Asp	Asp	Ser	Asp	Ala	S	r	Val	Ile	Cys	His	Gln	Leu	Gln	Leu
145					150						155					160
Gly	Gly	Lys	Gly	Ile	Ala	Lys	Gln	Thr	Pro	Phe	Ser	Gly	Leu	Gly	Leu	
				165					170						175	
Ile	Pro	Ile	Tyr	Trp	Ser	Asn	Val	Arg	Cys	Arg	Gly	Asp	Glu	Glu	Asn	
			180					185					190			
Ile	Leu	Leu	Cys	Glu	Lys	Asp	Ile	Trp	Gln	Gly	Gly	Val	Cys	Pro	Gln	
	195						200					205				
Lys	Met	Ala	Ala	Ala	Val	Thr	Cys	Ser	Phe	Ser	His	Gly	Pro	Thr	Phe	
	210					215					220					
Pro	Ile	Ile	Arg	Leu	Ala	Gly	Gly	Ser	Ser	Val	His	Glu	Gly	Arg	Val	
225				230						235					240	
Glu	Leu	Tyr	His	Ala	Gly	Gln	Trp	Gly	Thr	Val	Cys	Asp	Asp	Gln	Trp	
			245						250					255		
Asp	Asp	Ala	Asp	Ala	Glu	Val	Ile	Cys	Arg	Gln	Leu	Gly	Leu	Ser	Gly	
		260					265						270			
Ile	Ala	Lys	Ala	Trp	His	Gln	Ala	Tyr	Phe	Gly	Glu	Gly	Ser	Gly	Pro	
	275					280						285				
Val	Met	Leu	Asp	Glu	Val	Arg	Cys	Thr	Gly	Asn	Glu	Leu	Ser	Ile	Glu	
	290					295					300					
Gln	Cys	Pro	Lys	Ser	Ser	Trp	Gly	Glu	His	Asn	Cys	Gly	His	Lys	Glu	
305				310						315					320	
Asp	Ala	Gly	Val	Ser	Cys	Thr	Pro	Leu	Thr	Asp	Gly	Val	Ile	Arg	Leu	
			325						330					335		
Ala	Gly	Gly	Lys	Gly	Ser	His	Glu	Gly	Arg	Leu	Glu	Val	Tyr	Tyr	Arg	
		340						345					350			
Gly	Gln	Trp	Gly	Thr	Val	Cys	Asp	Asp	Gly	Trp	Thr	Glu	Leu	Asn	Thr	
	355						360					365				
Tyr	Val	Val	Cys	Arg	Gln	Leu	Gly	Phe	Lys	Tyr	Gly	Lys	Gln	Ala	Ser	
	370					375					380					
Ala	Asn	His	Phe	Glu	Glu	Ser	Thr	Gly	Pro	Ile	Trp	Leu	Asp	Asp	Val	
385				390						395					400	
Ser	Cys	Ser	Gly	Lys	Glu	Thr	Arg	Phe	Leu	Gln	Cys	Ser	Arg	Arg	Gln	
			405						410					415		
Trp	Gly	Arg	His	Asp	Cys	Ser	His	Arg	Glu	Asp	Val	Ser	Ile	Ala	Cys	
		420						425					430			
Tyr	Pro	Gly	Gly	Glu	Gly	His	Arg	Leu	Ser	Leu	Gly	Phe	Pro	Val	Arg	
	435						440					445				

Leu Met Asp Gly Glu Asn Lys Lys Glu Gly Arg Val Glu Val Phe Ile  
 450 455 460  
 Asn Gly Gln Trp Gly Thr Ile Cys Asp Asp Gly Trp Thr Asp Lys Asp  
 465 470 475 480  
 Ala Ala Val Ile Cys Arg Gln Leu Gly Tyr Lys Gly Pro Ala Arg Ala  
 485 490 495  
 Arg Thr Met Ala Tyr Phe Gly Glu Gly Lys Gly Pro Ile His Val Asp  
 500 505 510  
 Asn Val Lys Cys Thr Gly Asn Glu Arg Ser Leu Ala Asp Cys Ile Lys  
 515 520 525  
 Gln Asp Ile Gly Arg His Asn Cys Arg His Ser Glu Asp Ala Gly Val  
 530 535 540  
 Ile Cys Asp Tyr Phe Gly Lys Lys Ala Ser Gly Asn Ser Asn Lys Glu  
 545 550 555 560  
 Ser Leu Ser Ser Val Cys Gly Leu Arg Leu Leu His Arg Arg Gln Lys  
 565 570 575  
 Arg Ile Ile Gly Gly Lys Asn Ser Leu Arg Gly Gly Trp Pro Trp Gln  
 580 585 590  
 Val Ser Leu Arg Leu Lys Ser Ser His Gly Asp Gly Arg Leu Leu Cys  
 595 600 605  
 Gly Ala Thr Leu Leu Ser Ser Cys Trp Val Leu Thr Ala Ala His Cys  
 610 615 620  
 Phe Lys Arg Tyr Gly Asn Ser Thr Arg Ser Tyr Ala Val Arg Val Gly  
 625 630 635 640  
 Asp Tyr His Thr Leu Val Pro Glu Glu Phe Glu Glu Glu Ile Gly Val  
 645 650 655  
 Gln Gln Ile Val Ile His Arg Glu Tyr Arg Pro Asp Arg Ser Asp Tyr  
 660 665 670  
 Asp Ile Ala Leu Val Arg Leu Gln Gly Pro Glu Glu Gln Cys Ala Arg  
 675 680 685  
 Phe Ser Ser His Val Leu Pro Ala Cys Leu Pro Leu Trp Arg Glu Arg  
 690 695 700  
 Pro Gln Lys Thr Ala Ser Asn Cys Tyr Ile Thr Gly Trp Gly Asp Thr  
 705 710 715 720  
 Gly Arg Ala Tyr Ser Arg Thr Leu Gln Gln Ala Ala Ile Pro Leu Leu  
 725 730 735  
 Pro Lys Arg Phe Cys Glu Glu Arg Tyr Lys Gly Arg Phe Thr Gly Arg  
 740 745 750

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Met	Leu	Cys	Ala	Gly	Asn	Leu	His	Glu	His	Lys	Arg	Val	Asp	Ser	Cys
755				760				765							
Gln	Gly	Asp	Ser	Gly	Gly	Pro	Leu	Met	Cys	Glu	Arg	Pro	Gly	Glu	Ser
770				775				780							
Trp	Val	Val	Tyr	Gly	Val	Thr	Ser	Trp	Gly	Tyr	Gly	Cys	Gly	Val	Lys
785				790				795				800			
Asp	Ser	Pro	Gly	Val	Tyr	Thr	Lys	Val	Ser	Ala	Phe	Val	Pro	Trp	Ile
805				810				815							
Lys	Ser	Val	Thr	Lys	Leu										
820															